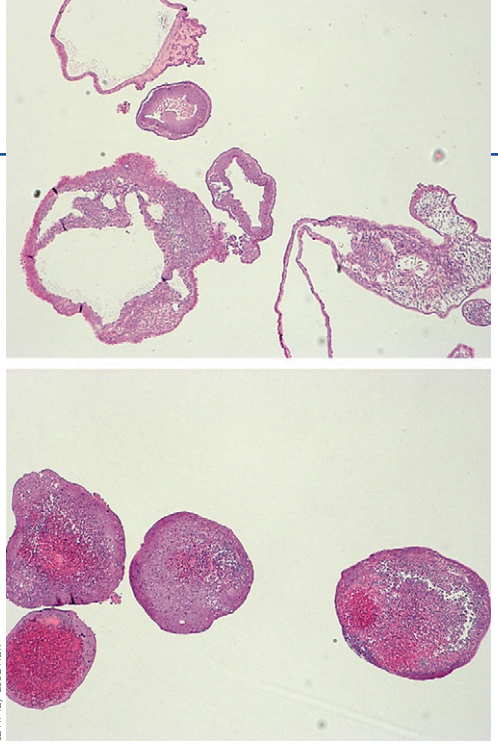


LEVINE/ELSEVIER

**Embryoid bodies can't cavitate (top) if their cells don't eat themselves (bottom).**

## Self-eating embryos

Embryonic cells that cannot eat themselves also can't signal for other cells to eat them, report Xueping Qu, Beth Levine, and colleagues (University of Texas, Dallas, TX).

During embryonic development, the carving out of the body's shape requires a vast number of cells to be eliminated. Coincident with this large-scale programmed cell death, cells also perform autophagy, but whether this self-eating is required for normal embryogenesis was unclear.

To address this question, Qu et al. grew autophagy-deficient embryo-like structures in culture. These embryoid bodies normally develop internal cavities, but, in the absence of autophagy, the bodies remained solid.

The lack of cavitation was not due to a lack of programmed cell death but instead to a failure in clearance of the dead cells. Apoptotic cells normally express signals that tell waste disposal cells to clean-up their dying remains. In the autophagy-lacking embryoid bodies, however, these signals were missing.

The signals could be restored by providing the embryoid bodies with an energy boost. By breaking down and recycling cell components, autophagy provides the cell with energy. The autophagy-deficient embryoid bodies thus had reduced energy production, which seems to prevent their dying cells from calling the clean-up crew. JCB

Reference: Qu, X., et al. 2007. *Cell.* 128:931–946.

Text by Ruth Williams
ruth.williams@rockefeller.edu

## Langerhans cells limit HIV invasion

A suspected entry route for HIV turns out to be a dead-end, report Lot de Witte, Teunis Geijtenbeek (VU University Medical Centre, Amsterdam, Netherlands), and colleagues. Langerhans cells, rather than transmitting the virus to T cells, trap HIV-1 and thus act as a barrier to infection.

The primary targets for HIV-1 invasion are CD4-expressing T cells. HIV-1 uses the CD4 receptor to gain entry. The first immune cells that HIV-1 meets in the body's mucosa, however, are a subset of dendritic cells (DCs) called Langerhans cells (LCs). Most DCs internalize HIV-1 into nonlysosomal compartments and later transmit the virus to CD4-expressing T cells in lymphoid tissues. But in LCs, the team now shows, internalization is the end of the road for HIV-1.

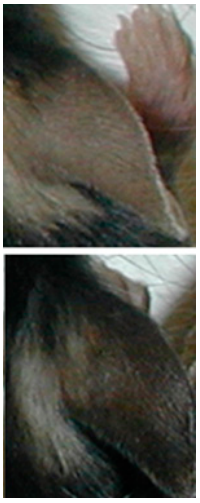
Binding and internalization of HIV-1 to DCs depends on C-type cell surface lectins. The team shows that, on LCs, HIV-1 associates with a C-type lectin called Langerin at the cell surface and in intracellular vesicles. Internalization via Langerin resulted in degradation of the virus and thus prevented transmission.

When the team blocked Langerin, LCs actually increased viral transmission. The LCs probably instead became infected via the small amount of CD4 these cells express. Ordinarily this CD4 route would be out-competed by the abundance of Langerin.

The fate of HIV-1 vesicles in LCs is not yet clear. It is likely that they are targeted to lysosomes for degradation. Because other DCs transmit virus via the lectin pathway, inhibitors of C-type lectins were proposed for use as microbicides. Such an approach, however, would also knock out the ability of LCs to intercept and neutralize invading HIV-1. JCB

Reference: de Witte, L., et al. 2007. *Nat. Med.* doi:10.1038/nm1541.

## Tanning with p53



FISHER/ELSEVIER

**Mice lacking p53 (top) don't tan.**

The guardian of the genome, p53, can induce DNA repair, hold the cell cycle while repair work is done, and induce apoptosis if the damage is too great. Now, Rutao Cui, David Fisher (Harvard Medical School, Boston, MA), and colleagues have discovered a new way in which p53 protects our genomes—it gives us a suntan.

The DNA damage caused by UV exposure has long been known to up-regulate p53. Mice that lack p53 have a propensity to develop tumors upon UV exposure. The team now finds that these mice also fail to tan.

Tanning occurs when keratinocytes make more melanocyte-stimulating hormone (MSH) and thus induce melanocytes to produce large amounts of the pigment melanin. MSH is a cleavage product of the POMC pro-hormone. The team found that p53 directly binds to, and increases transcription from, the *POMC* gene promoter in response to UV treatment.

p53 also promoted POMC and melanin production when induced by factors other than UV, such as the cancer drug etoposide. Melanin provides protection to the skin by mopping up free radicals and by acting as a direct shield from UV radiation. Inducing melanin via the p53 pathway might potentially provide a sunless golden tan. This strategy might be good for reducing cancer risk, although vitamin D levels may need supplementing if the sun were continuously avoided. JCB

Reference: Cui, R., et al. 2007. *Cell.* 128:853–864.